REMARKS

This is a full and timely response to the non-final Office Action mailed June 1, 2005. Upon entry of the amendments in this response, claims 1 – 10 remain pending. In particular, Applicant has amended claims 1 and 9. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

I. Claim Objections

The Office Action indicates that claim 1 is objected to because of an informality. Specifically, the Office Action alleges that "in line 8, after 'the second station', '.' is required.

Applicant has amended claim 1 to remove the indicated informality. Accordingly, Applicant submits that the objection to claim 1 should be withdrawn.

II. Claims 1 - 9 are Patentable Over *Huang*

The Office Action rejects claims 1 - 9 under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. 6,483,846 to Huang ("*Huang*"). For at least the reasons set forth below, the rejection should be withdrawn and the claims allowed.

General Remarks

Although Applicant addresses the §102 rejections of each of claims 1 - 9 individually below, Applicant believes a brief summary of *Huang* and embodiments of the instant application may be helpful to realize a number of distinctions between *Huang* and claims 1 - 9.

In general, *Huang* is directed to a middleware-based real-time communication system having a real time queue 152 and a non-real time queue 154. "A bandwidth partition scheme is implemented such that for a given repetitive cycle of time, MRTE layer 150 implements a deterministic schedule for packets in the real-time queue where collisions on the network are avoided for a first time period, and a standard Ethernet protocol during a second time period to allow transmission of non-real time packets obtained from the non-real time queue 154." (Col. 5, lines 34 – 41). Essentially, the network traffic from each queue becomes bifurcated, the packets in the real-time queue being transmitted using the determinative scheme during one time period, and the non-real-time packets obtained from the non-real-time queue 154 being transmitted using standard Ethernet during another time period.

For example, the deterministic schedule could be "a token-based protocol by which a token circulating among the Ethernet nodes determines which node should transmit packets at any point in time" (col. 3, lines 45 -47), or "various implementations of Time-Division Multiple Access (TDMA), a technology using Time-Division Multiplexing (TDM)."

Huang does not apparently disclose that the deterministic protocols, used to transmit data output from real-time queue 152, sense the medium for an opportunity to transmit message data units.

Huang also does not apparently prioritize the transmissions of data traffic between the real-time and non-real time queues. Rather, data transmissions from each queue occur during the time allocated for each queue (*i.e.* the above referenced, "first time period" and "second time period"). *Huang* does disclose that the real-time traffic queue 152 itself

"has traffic sorted by criticality" (col. 5, line 23 – 24), and that the non-real time queue 154 "is sorted by first in, first out." (Col. 5, line 28).

In contrast to the real-time communication system of *Huang*, the systems and methods disclosed in the instant application are directed to ordering data messages having differing levels of priority. For example, looking to FIG. 3 and pg. 7 line 15 - pg. 8, line 23 of the specification, each station communicating on a shared communications medium includes a number of queues 50 within data buffers 34, each queue 50 for holding data message units having an assigned traffic classification. Once placed within one of the queues, the data message units are released in accordance with a coordination function implemented in a scheduler.

The coordination function prioritizes the transmission of data message units from each queue in accordance with a defined access control algorithm. This access control algorithm is implemented on all stations.

One access control algorithm, for example, uses carrier sense, multiple access with collision avoidance (CSMA/CA). A station using the embodiment of the CSMA/CA algorithm senses the communication medium to determine if another station is already transmitting on the communication medium. The medium is said to be idle when no transmission is sensed. Each queue 50 is assigned a minimum specified idle duration period for which the medium must remain idle before transmitting a message data unit. This minimum specified idle duration period differs for each traffic classification and, hence, each queue 50.

After a station has determined that the medium has been idle for the specified idle duration period, the station determines whether any other higher priority queues

within the station also have data ready to transmit. A lower priority queue having a transmission opportunity at the same time as a higher priority queue within the same station may defer to the higher priority queues, and the data in the lower priority queue is treated as though it experienced an external collision on the wireless medium (even though it was not actually transmitted on the medium).

In the event of a collision (whether due to an internal deferral to a higher-priority queue or an external, actual collision on the communication medium), in addition to waiting the specified duration period, a random back off is computed for the queue. The random back off is decremented for each time period after the duration period ends. Upon another transmission being sensed on the medium, the specified duration period is restarted. However, upon the duration period being completed and the random back off reaching zero, the queue is given another transmission opportunity (subject to no other higher priority queues in the station having data to transmit at the same time).

Thus having summarized *Huang* and embodiments of the application, a number of distinctions with respect to the pending claims are set forth in detail below.

Independent Claim 1

Independent claim 1 recites:

> 1. A method comprising:
> directing to a first output queue at a first station of a communication network, message data units to be transmitted over a communication medium and having a first traffic classification;
> directing to a second output queue at the first station, message data units to be transmitted over the communication medium and having a second traffic classification;
> ***sensing the communication medium for an opportunity to transmit message data units without interference from message data units transmitted by a second station, according to sets of rules that vary by traffic classification yet are common to the first station and the second station.***

(*Emphasis added*). Applicant respectfully submits that independent claim 1 patently defines over *Huang* for at least the reason that *Huang* fails to disclose, teach, or suggest the features emphasized in bold text above.

The Office Action apparently alleges that the "message data units to be transmitted over a communication medium and having a first traffic classification" that are directed to "a first output queue" are equivalent to the real-time data directed into real-time queue 152 of *Huang*. (Office Action, pg. 2). Likewise, the Office Action apparently alleges that the "message data units to be transmitted over the communication medium and having a second traffic classification" that are directed to "a second output queue," as claimed, are equivalent to the real-time data directed into real-time queue 154 of *Huang*. (Office Action, pg. 2).

The Office Action also apparently alleges that *Huang* discloses "sensing the communication medium for an opportunity to transmit message data units without interference from message data units transmitted by a second station, according to sets of

rules that vary by traffic classification" in light of the scheduling of data in the real-time and non-real-time queues according to either (1) a deterministic module or (2) a collision avoidance module, respectively.

However, in contrast to claim 1, *Huang* discloses "a bandwidth partition scheme" in which packets in the real-time queue 152 are transmitted using a deterministic scheme (*e.g.* TDMA or token-based approach) and packets in the non-real-time queue are transmitted according to a standard Ethernet protocol (*e.g.* using carrier-sense multiple access (CSMA)). (Col. 5, 34 – 40). *Huang* does not disclose "sensing of the communication medium for an opportunity to transmit message data units" that is performed "according to sets of rules that vary by traffic classification" as claimed. Rather, data transmitted from the real-time queue 152, using the deterministic approach, is not described as "sensing of the communication medium" at all. In fact, *Huang* appears to teach away from the claimed approach, indicating that CSMA/CD networks under "heavy loading may lead to indeterminate access time" (Col. 1, lines 52-53), and instead, favoring the deterministic approach for real-time traffic.

Thus, *Huang* cannot be said to disclose, teach, or suggest "***sensing the communication medium for an opportunity to transmit message data units without interference from message data units transmitted by a second station, according to sets of rules that vary by traffic classification yet are common to the first station and the second station,"*** as recited in claim 1, and the claim should be allowed for at least this reason.

Furthermore, because independent claim 1 patently defines over *Huang*, dependent claims 2 – 6 are allowable as a matter of law for at least the reason that claims

2 - 6 contain all the features and elements of its corresponding independent claim. See, e.g. *In re Fine,* 837 F. 2d 1071 (Fed. Cir. 1988).

Dependent Claim 3

Applicant submits that the 35 U.S.C. § 102 rejection to claim 3 is rendered moot in light of any of the arguments made above and, therefore, claim 3 is allowable as a matter of law for at least the reason that claim 3 contains all the features and elements of its corresponding independent claim 1. For at least this reason, Applicant requests that the rejection of claim 3 be withdrawn.

Applicant submits that claim 3 is patentable over *Huang* for at least the additional and independent reason that *Huang* does not disclose, teach, or suggest "***attempting to retransmit, after a respective interval defined differently by each said set of rules, any message data unit transmitted over the communication medium by a station that collides with a message data unit transmitted by another station***."

The Office Action alleges this feature is disclosed at lines col. 1, lines 43 – 47 of *Huang*, which recites that:

> A "collision" of data packets may occur if two or more nodes begin transmitting simultaneously on the network. Colliding nodes will detect such a collision of data and terminate their transmission, ***waiting a randomly-determined time period before attempting transmission again***. Under current standards, a failure will be generated after a node makes sixteen unsuccessful attempts to transmit its data packet without collision.

(*Emphasis added*). However, as explained above with respect to claim 1, *Huang* discloses that the non-real time queue transmits data packets using CSMA/CD, but that the data packets in the real-time queue are transmitted using a deterministic scheme such as TDMA or token passing. For the deterministic scheme, by definition, there are no

collisions and subsequent retransmissions. (*See*, col. 2 line 66 – col. 3, line 3, "During each cycle, a first time interval is provided for real time data packet traffic using a deterministic scheduling protocol such as by passing a token, such that no collisions can occur.")

Thus, *Huang* does not disclose, teach, or suggest "***attempting to retransmit, after a respective interval defined differently by each said set of rules, any message data unit transmitted over the communication medium by a station that collides with a message data unit transmitted by another station***" as recited in claim 3, and the claim should be allowed for at least this additional reason.

Dependent Claims 2 and 4 - 6

Applicant submits that the 35 U.S.C. § 102 rejection to claims 2 and 4 - 6 is rendered moot in light of any of the arguments made above and, therefore, claim 2 and 4 - 6 are allowable as a matter of law for at least the reason that claims 2 and 4 - 6 contain all the features and elements of their corresponding independent claim 1. For at least this reason, Applicant requests that the rejection of claims 2 and 4 – 6 be withdrawn.

Independent Claim 7

Independent claim 7 recites:

> 7. A method for media access control in a communication network which includes a plurality of communication stations adapted to communicate over a shared communication medium and to support quality of service classes of communication sessions wherein message data units corresponding to one of said quality of service classes has a different priority level than message data units corresponding to another of said quality of service classes, comprising:

> ***directing to a first output queue at a first station of the communication network, message data units to be transmitted and having a first level of priority***;
>
> ***directing to a second output queue at the first station, message data units to be transmitted and having a second level of priority;***
>
> sensing the communication medium for an opportunity to transmit data message units without colliding with data message units transmitted by any other station, ***based on a set of rules that are specific to each priority***;
>
> if the first and second output queues each contain message data units to be transmitted during a particular opportunity to transmit, ***invoking a mechanism that preferentially transmits a message data unit by priority level and said sets of rules***.

(*Emphasis added*). Applicant respectfully submits that independent claim 7 patently defines over *Huang* for at least the reason that *Huang* fails to disclose, teach, or suggest the features emphasized in bold text above.

More specifically, Applicant submits that claim 7 is patentable over *Huang* for at least the reason that *Huang* does not disclose, teach, or suggest "***directing to a first output queue at a first station of the communication network, message data units to be transmitted and having a first level of priority***" or "***directing to a second output queue at the first station, message data units to be transmitted and having a second level of priority.***"

Although claim 7 differs in a number of respects from claim 1, the Office Action rejects claim 7 by reference to the rejection of claim 1. (Office Action, pg. 4). However, the Office Action apparently alleges that the real-time data directed to the real-time queue 152 of *Huang* is equivalent to the claimed "first level of priority," while the "non-real-time data" directed to the non-real time queue of *Huang* is equivalent to the claimed

"second level of priority." However, Applicant submits that the real-time-data and non-real-time data of *Huang* can not be considered equivalent to the claimed priority levels.

For example, *Huang* discloses that:

> The first queue comprises a real time queue 152 for queuing information packets that have been accepted for transmission on a real time basis. In other words, ***packets in this queue are guaranteed to be sent without collision with another packet unless there is a network failure***. The ***real time traffic queue 152 has traffic sorted by criticality***. A second queue comprises a non-real time queue for data packets that do ***not need to arrive at a destination in real time to be of value to the receiving node***. The second queue 154 is sorted by first in, first out.

(Col. 5, lines 18 – 28). Thus, the real time data of *Huang* is apparently needed to arrive on a ***predictable*** basis to be of value to the receiving node. Notably, *Huang* does <u>not</u> accomplish this predictability by prioritizing the transmission of real-time data with respect to the data in the non-real time queue. Rather, "a bandwidth partition scheme is implemented such that for a given repetitive cycle of time, MRTE layer 150 implements a deterministic schedule for packets in the real time queue where collisions on the network are avoided for a first time period, and a standard Ethernet protocol during a second time period to allow transmission of non-real time packets obtained from the non-real time queue 154." (Col. 5, lines 34 – 41).

At most, *Huang* discloses that the real time traffic queue 152 itself "has traffic sorted by criticality" (col. 5, line 23 – 24). Thus, according to *Huang*, any sorting of the data to be transmitted occurs within a single queue..

Thus, Applicant submits that *Huang* does not disclose, teach, or suggest "***directing to a first output queue at a first station of the communication network,***

message data units to be transmitted and having a first level of priority" or ***"directing to a second output queue at the first station, message data units to be transmitted and having a second level of priority"*** as recited in claim 7, and the claim should be allowed for this reason alone.

Claim 7 is patentable over *Huang* for at least the additional and independent reason that *Huang* does not disclose, teach, or suggest "***sensing the communication medium for an opportunity to transmit data message units without colliding with data message units transmitted by any other station, based on a set of rules that are specific to each priority***" as recited in claim 7.

Rather, unlike claim 7, *Huang* transmits message data units in each of queues 152 and 154 based on a bandwidth partition scheme having "a deterministic schedule for packets in the real-time queue where collisions on the network are avoided for a first time period, and a standard Ethernet protocol during a second time period." (Col. 5, 37 – 39). As discussed above, the deterministic schedule does not sense the communication medium to transmit data message units.

Furthermore, claim 7 is patentable over *Huang* for at least the additional and independent reason that *Huang* does not disclose, teach, or suggest that "if the first and second output queues each contain message data units to be transmitted during a particular opportunity to transmit, invoking a mechanism that ***preferentially transmits a message data unit by priority level and said sets of rules***."

Again, *Huang* discloses a bandwidth partition scheme. The transmission of data in queue 152 is not prioritized with respect to the data in queue 154. Rather, data is transmitted from real-time queue 152 during "a given repetitive cycle of time." (Col. 5,

line 35). Thus, *Huang* does not disclose, teach, or suggest "if the first and second output queues each contain message data units to be transmitted during a particular opportunity to transmit, invoking a mechanism that ***preferentially transmits a message data unit by priority level and said sets of rules***" as recited in claim 7, and the claim should be allowed for this additional reason alone.

Furthermore, because independent claim 7 patently defines over *Huang*, dependent claim 8 is allowable as a matter of law for at least the reason that claim 8 contains all the features and elements of its corresponding independent claim. See, e.g. *In re Fine,* 837 F. 2d 1071 (Fed. Cir. 1988).

Dependent Claim 8

Applicant submits that the 35 U.S.C. § 102 rejection to claim 8 is rendered moot in light of any of the arguments made above and, therefore, claim 8 is allowable as a matter of law for at least the reason that claim 8 contains all the features and elements of its corresponding independent claim 7. For at least this reason, Applicant requests that the rejection of claim 8 be withdrawn.

Applicant submits that claim 8 is patentable over *Huang* for at least the additional and independent reason that *Huang* does not disclose, teach, or suggest "***attempting to retransmit over the communication medium, after a respective interval of random duration defined differently for each corresponding level of priority, any message data unit transmitted by the first station that externally collides with a message data unit transmitted by another station over the communication medium***" as recited in claim 8.

Huang discloses, at most, that according to standard Ethernet protocol, a "'collision' of data packets may occur if two or more nodes begin transmitting simultaneously on the network" and "colliding nodes will detect such a collision of data and terminate their transmission, waiting a randomly-determined time period before attempting transmission again." (Col. 1, lines 43 – 47).

However, as explained above with respect to claim 1, *Huang* discloses that the non-real time queue transmits data packets using CSMA/CD, but that the data packets in the real-time queue are transmitted using a deterministic scheme such as TDMA or token passing. For the deterministic scheme, by definition, there are no collisions and subsequent retransmissions. (*See*, col. 2 line 66 – col. 3, line 3, "During each cycle, a first time interval is provided for real time data packet traffic using a deterministic scheduling protocol such as by passing a token, such that no collisions can occur.") Thus, only the CSMA/CD approach may require a retransmission due to a collision, and therefore *Huang* discloses that only a single "random duration" is used, in contrast to "a respective interval of random duration defined differently for each corresponding level of priority" as claimed.

Thus, *Huang* does not disclose, teach, or suggest "***attempting to retransmit over the communication medium, after a respective interval of random duration defined differently for each corresponding level of priority, any message data unit transmitted by the first station that externally collides with a message data unit transmitted by another station over the communication medium***" as recited in claim 8, and the claim should be allowed for at least this additional reason.

Independent Claim 9

Independent claim 9, as amended, recites:

> 9. A system for exchanging message data units over a communication medium shared by other systems in a local area network, comprising:
>
> a first output queue adapted to receive message data units having a first traffic classification, said first output queue being operable to release message data units for transmission over a communication medium in accordance with a first set of rules corresponding to the first traffic classification;
>
> a second output queue adapted to receive message data units having a second traffic classification, said second output queue being operable to release message data units for transmission over a communication medium in accordance with a second set of rules corresponding to the second traffic classification; and
>
> ***a transceiver operative to sense the communication medium for an opportunity to transmit the message data units from each of the first and second output queues, without interference from message data units transmitted by a second station, and to transmit the message data units from each of said first and second output queues according to said first and second sets of rules.***

(*Emphasis added*). Applicant respectfully submits that independent claim 9 patently defines over *Huang* for at least the reason that *Huang* fails to disclose, teach, or suggest the features emphasized in bold text above.

For example, claim 9 is patentable over *Huang* for at least the reason that *Huang* does not disclose, teach, or suggest "a transceiver operative to ***sense the communication medium for an opportunity to transmit the message data units from each of the first and second output queues"*** as recited in claim 9.

Unlike claim 9, *Huang* discloses, at most, "a bandwidth partition scheme" in which packets in a real-time queue are transmitted using a deterministic scheme (*e.g.* TDMA or token-based approach) and packets in the non-real-time queue are transmitted according to a normal Ethernet scheme (*e.g.* using carrier-sense multiple access

(CSMA)). The deterministic scheme for transmitting data output from the real-time queue 152, does not apparently sense the communication medium. Thus, *Huang* cannot be said to disclose, teach, or suggest "a transceiver operative to ***sense the communication medium for an opportunity to transmit the message data units from each of the first and second output queues"*** as recited in claim 9, and the claim should be allowed for at least this reason.

Furthermore, because independent claim 9 patently defines over *Huang*, dependent claim 10 is allowable as a matter of law for at least the reason that claim 9 contains all the features and elements of its corresponding independent claim. See, e.g. *In re Fine,* 837 F. 2d 1071 (Fed. Cir. 1988).

Dependent Claims 2 and 4 - 6

Applicant submits that the 35 U.S.C. § 102 rejection to claims 2 and 4 - 6 is rendered moot in light of any of the arguments made above and, therefore, claim 2 and 4 - 6 is allowable as a matter of law for at least the reason that claim 2 and 4 - 6 contain all the features and elements of their corresponding independent claim 1. For at least this reason, Applicant requests that the rejection of claims 2 and 4 – 6 be withdrawn.

III. Claim 10 is Patentable Over *Huang* in View of *Ghanma*

The Office Action rejects claim 10 under 35 U.S.C. §103(a) as allegedly being unpatentable over *Huang* in view of U.S. Patent No. 6,470,025 to Ghanma ("*Ghanma*"). Applicant submits that the 35 U.S.C. § 103 rejection to claim 10 is rendered moot in light of any of the argument made above and, therefore, claim 10 is allowable as a matter of law for at least the reason that claim 10 contains all the features and elements of its

corresponding independent claim 9. For at least this reason, Applicant requests that the rejection of claim 10 be withdrawn.

IV. Prior Art Made of Record

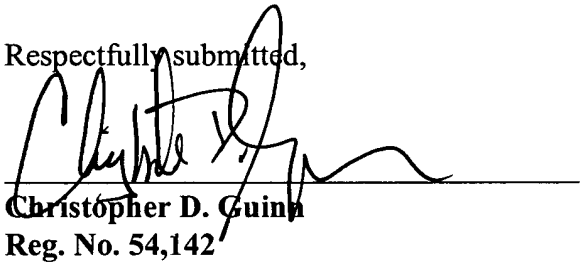
The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

CONCLUSION

The Applicant respectfully submits that all claims are now in condition for allowance, and request that the Examiner pass this application to issuance. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

No fee is believed to be due in connection with this response. If, however, any fee is deemed to be payable, you are hereby authorized to charge any such fee to Deposit Account No. 20-0778.

Respectfully submitted,



Christopher D. Guinn
Reg. No. 54,142

THOMAS, KAYDEN,
HORSTEMEYER & RISLEY, L.L.P.
Suite 1750
100 Galleria Parkway N.W.
Atlanta, Georgia 30339
(770) 933-9500